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| 10/822,572 | 04/12/2004 | Shawn L. Lloyd | ITL.1113US (P18785) | 2638 |
| 21906 | 7590 | 06/07/2005 | EXAMINER | |
| TROP PRUNER & HU, PC 8554 KATY FREEWAY SUITE 100 HOUSTON, TX 77024 | | | HARVEY, JAMES R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2833 | |

DATE MAILED: 06/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/822,572

Applicant(s)

LLOYD ET AL.

Examiner

James R. Harvey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

- The following claim(s) are objected to because of the noted informalities:
 - In reference to Claim(s) 1, the recitation “an aperture” (line 6) lacks proper antecedent basis. For purposes of examination, it is assumed that the language is intended to mean --said aperture--.
 - . An examination based on the merits, as best understood, is addressed below.
 - In reference to Claim(s) 2 and 3, the recitation “said spring contacts to make” appears to be a typographical error. For purposes of examination, it is assumed that the language is intended to mean --said spring contacts are adapted to make--. An examination based on the merits, as best understood, is addressed below.
 - In reference to Claim(s) 9, the recitation “alignment feature” lacks proper antecedent basis. Claim 9 is typed as dependent upon claim 8. The recitation is properly introduced in claim 6. For purposes of examination, it is assumed that this is a typographical error and applicant intended to type --6--instead of “8”. An examination based on the merits, as best understood, is addressed below.
 - In reference to Claim(s) 15, the recitation “protrusion” does not support claims 16 and 17 that are dependent upon them. For purposes of examination, it is assumed that the language is intended to be typed as --feature--. An examination based on the merits, as best understood, is addressed below.
 - Appropriate response to the above is required.

Claim Rejections - 35 USC § 102

- The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

- The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**** Claim(s) 11 and 15-19 are rejected under 35 U.S.C. 102(b) as being anticipated by over Hornchek et al. (US 6541991).**

-- In reference to Claim(s) 11, Hornchek shows (cover sheet)

a printed circuit board 310;

a socket 300 coupled to the printed circuit board,

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the socket including a housing 370 having an upper surface 372 with a plurality of solder ball receiving apertures 376 formed therein and a plurality of spring contacts 320 aligned with the apertures to electrically engage a solder ball inserted into an aperture.

-- In reference to Claim(s) 15, Hornchek shows (cover sheet) the housing 370 includes a feature 380 on its upper surface.

In particular reference to the recitation "to align a land grid array package with the housing" is seen to be for the intended use of the claimed structure and is given little patentable weight, since it has been held a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Further, the claim language is not seen to claim any structure that would inhibit the reference from being used for the same purpose as the intended use recitations of the claim.

-- In reference to Claim(s) 16, Hornchek shows (figure 4) the alignment feature is L-shaped.

-- In reference to Claim(s) 17, Hornchek shows (figure 4) two L-shaped alignment features opposed diagonally from one another on the housing.

-- In reference to Claim(s) 18 and 19, Hornchek teaches (column 4, line 50) a ball grid array package or a land grid array package engaged on the socket housing (5955888; (column 9, lines 4-7).

** Claim(s) 1-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hornchek et al. (US 6541991) in view of Higashi (US Pub. 2004/0166702).

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-- In reference to Claim(s) 1, Hornchek shows (cover sheet)

an upper surface 372 with a plurality of solder ball receiving apertures 376 formed therein; and

a plurality of spring contacts 320 (column 4, line 50 and figure 8 of US Patent 5955888) aligned with the apertures to electrically engage a solder ball 126B (figure 6c) inserted into the aperture.

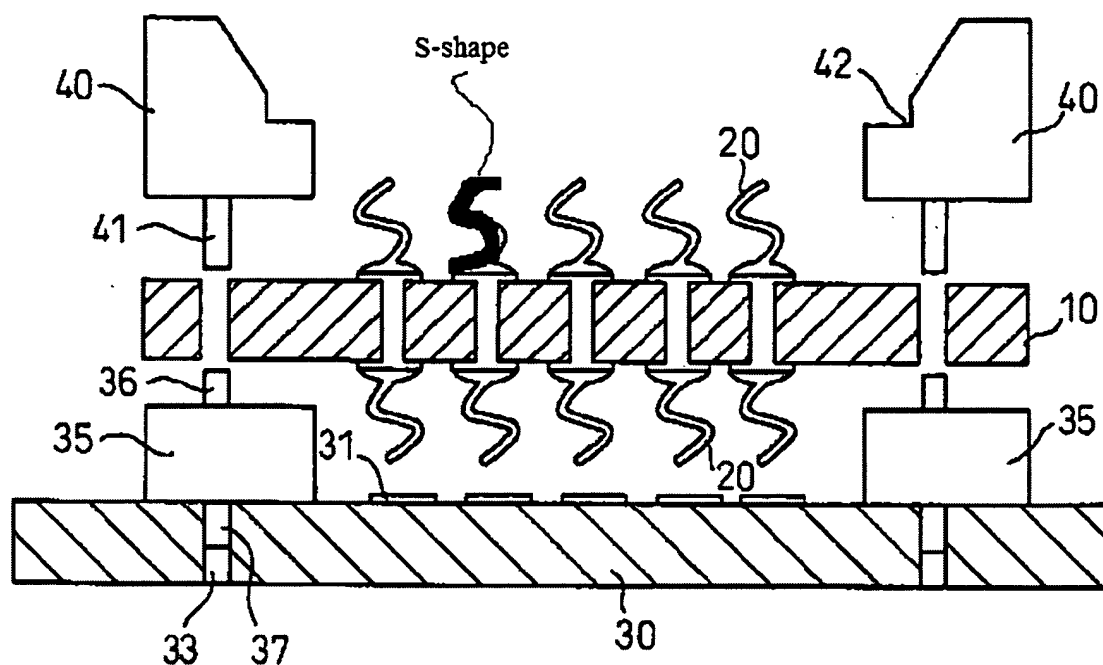
However, Hornchek does not show that the spring contacts are S-shaped.

Higashi shows spring contacts 20 (see examiner's figure) are S-shaped.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the shape spring contact to be an S-shape, since applicant has not presented any explanation that this particular shape is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing a mating surface between two parts. A change in shape is generally recognized as being within the level of ordinary skill in the art. In re Dailey, 149 USPQ 47 (CCPA 1976).

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the mounting plate 350 with spring contacts 320 of Hornchek with the mounting plate 10 with the S-shaped spring contact 20 Higashi. One skilled in the art would have been motivated to replace the mounting plate and spring contacts because the spring contacts of Higashi are have less components thereby making them easier and less expensive to manufacture.

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-- In reference to Claim(s) 2 and 3, Higashi shows (figure 5) the spring contacts are adapted to make wiping electrical contact with solder balls (claim 2) or with lands (claim 3).

In particular reference to the recitation “adapted to” is seen to be for the intended use of the claimed structure and is given little patentable weight, since it has been held a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Further, the claim language is not seen to claim any structure that would inhibit the reference from being used for the same purpose as the intended use recitations of the claim.

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-- In reference to Claim(s) 4 and 13, Hornchek as modified by Higashi shows the S-shaped spring contacts include opposed contact arms (the top and bottom distal ends; Higashi (cover sheet)), one of which extends upwardly and the other which extends downwardly.

-- In reference to Claim(s) 5, Hornchek as modified by Higashi shows (cover sheet of Hornchek) the socket includes a body 370, the body having the apertures 376 formed therein.

-- In reference to Claim(s) 6, Hornchek as modified by Higashi (cover sheet) shows an alignment (380; Hornchek) feature extending upwardly from the body 370.

In particular reference to the recitation “to align a land grid array package with the socket” is seen to be for the intended use of the claimed structure and is given little patentable weight, since it has been held a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Further, the claim language is not seen to claim any structure that would inhibit the reference from being used for the same purpose as the intended use recitations of the claim.

-- In reference to Claim(s) 7, Hornchek as modified by Higashi shows (figure 6; Higashi) the spring contacts include an upwardly extending arm to make contact with an integrated circuit package 50 and a downwardly extending arm to make contact with an underlying circuit board 30.

-- In reference to Claim(s) 8, Hornchek as modified by Higashi shows the socket includes a body (370; Hornchek) including an upwardly extending protrusion 347.

However, Hornchek does not show the protrusion 347 having a height less than the height of a solder ball 126B (figure 6c) for a ball grid array package.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the size of the height of Hornchek protrusion 347, since such a modification would have involved a mere change in the size or shape of a component. A change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Daily*, 149 USPQ 47 (CCPA 1976). One skilled in the art would have been motivated to reduce the size of the protrusion 347 of Hornchek in order to reduce the amount of material used and thus reduce the overall cost of the assembly.

-- In reference to Claim(s) 9, Hornchek (figure 4) shows the alignment feature 380 is L-shaped.

-- In reference to Claim(s) 10, Hornchek (figure 4) shows two L-shaped alignment features opposed diagonally from one another on the socket.

-- In reference to Claim(s) 12, the explanation of the rejection of the recitation "the contacts are S-shaped spring contacts" has been addressed in the rejection of claim 1.

-- In reference to Claim(s) 13, Hornchek as modified by Higashi shows the same structure as address with claim 4.

-- In reference to Claim(s) 14, Hornchek as modified by Higashi shows (figure 6; Hornchek) the printed circuit board 310 has lands (column 6, line 52; Hornchek) engaged by the spring contacts. The meaning of "lands" is not set forth in the claims and is thus deemed to be so broad that it is met by the applied reference showing traces (column 6, line 52 of Hornchek).

Conclusion

- The prior art listed on PTO form 892 that is made of record and not relied upon is considered pertinent to applicant's disclosure because it shows the state of the art with respect to applicant's claimed invention. Rathburn (6178629) shows a socket arrangement substantially the same as

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Hornchek and teaches (column 3, lines 50-65) that both LGA and BGA are compatible with the socket arrangement. Matsumura (6012929) shows a socket arrangement substantially the same as Hornchek and shows a package guide 14 on the cover sheet.

- Any inquiry concerning this communication or earlier communications from the examiner should be directed to James R. Harvey whose telephone number is 571-272-2007. The examiner can normally be reached on 8:00 A.M. To 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571-272-2800 extension 33.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James R. Harvey, Examiner

jrh

June 3, 2005

